## REMARKS

This Amendment responds to the Office Action dated August 24, 2004 in which the Examiner objected to the disclosure and claim 12, rejected claims 1 and 10 under 35 U.S.C. §102(b) and rejected claims 2-7 and 11-13 under 35 U.S.C. §103.

As indicated above, the specification has been amended in order to correct minor informalities. Therefore, applicants respectfully request the Examiner withdraws the objection to the disclosure.

As indicated above, claim 12 has been amended to depend from claim 9. Therefore, applicants respectfully request the Examiner approves the correction and withdraws the objection to claim 12.

As indicated above, claims 1 and 10 have been amended in order to make explicit what is implicit in the claims. The amendment is unrelated to a statutory requirement for patentability.

Claim 1 claims a method for optical measuring systems, comprising a sensor element connected to a measuring and control unit via one single optical fiber and being adapted for providing a signal corresponding to a measurement of a physical parameter influencing the sensor element. The method comprises the steps of: generation of a measuring signal that is brought to come in towards the sensor element, and detection of the measuring signal in the measuring and control unit by a single detector, after influencing the measuring signal in the sensor element. The measuring signal is partially reflected at a point along the one single optical fiber, located at a predetermined distance from the sensor element. The intensity of the signal corresponding to the partially reflected measuring signal by the single detector

is detected. A measurement of the parameter is determined based upon the intensity of the partially reflected signal and the intensity of the measuring signal.

Through the method of the claimed invention having one single optical fiber and using a single detector to detect a measuring signal and a partially reflected measuring signal as claimed in claim 1, the claimed invention provides a method for optical measuring systems in which unwanted influences from sources of error and interference are minimized. The prior art does not show, teach or suggest the method as claimed in claim 1.

Claim 10 claims a device for optical measuring systems, comprises a sensor element connected to a measuring and control unit via one single optical fiber and being adapted for providing a signal corresponding to a measurement of a physical parameter influencing the sensor element. A light source functions to generate a measuring signal brought to come in towards the sensor element. A detector is for detecting the intensity of the measuring signal in the measuring and control unit, after influencing the measuring signal in the sensor element. A semi-reflecting device is for partial reflection of the measuring signal at a point along the one single optical fiber at a predetermined distance from the sensor element. The detector is arranged for detection of the intensity of the signal corresponding to the partially reflected measuring signal. An evaluation unit is for determining a measurement of the parameter, based upon the intensity of the partially reflected signal and the intensity of the measuring signal from the detector.

Through the structure of the claimed invention having one single optical fiber and a (single) detector which detects both the intensity of the measuring signal and the partially reflected signal, as claimed in claim 1, the claimed invention provides a

device for optical measuring systems which minimizes unwanted influences from sources of error and interference. The prior art does not show, teach or suggest the invention as claimed in claim 10.

Claims 1 and 10 were rejected under 35 U.S.C. §102(b) as being anticipated by *Aagard* (U.S. Patent No. 4,487,206).

*Aagard* appears to disclose a fiber optic pressure sensor apparatus shown in FIGS. 2 and 3, has a hollow catheter tube 20' having encased therein three optic fibers 31, 32 and 33. A light source 34, such as an LED, which receives power from a control means 35, directs light into the fiber 31 which carries the light to the sensor tip assembly 40 affixed at the end of the catheter tube 20'. Reflected light returning from the tip through optic fibers 32 and 33 is sensed by reference sensor detector 36 and signal sensor detector 37, respectively, and the electrical signals from these detectors are connected to the control means 35. The ends of the fibers 31, 32 and 33 are bonded to a plastic body in the sensor tip assembly 40. As shown, the tip assembly consists of four parts: body 41, lens 42, tip 43 and diaphragm 44. (col. 2, lines 47-62) The body 41 is machined or molded at a first end 45 to accommodate the three optical fibers (signal 33, reference 32 and source 31). The fibers are bonded in place with an (approximately) index-matching adhesive. At a second end 46 the body is recessed at 47 and accommodates the lens 42, which is also secured with an (approximately) index-matching adhesive. The periphery 48 of the second end is preferably spherical so that when it is coated with a reflective metal such as aluminum it forms a ring-like spherical, annular mirror 49 surrounding the lens for reflecting light within the body of the tip assembly. The coating operation may preferably be done before inserting the lens, and may be accomplished using

standard vapor-phase deposition methods. Finally, the tip 43 clamps the diaphragm 44 against the ring 50 that surrounds the refractive element. (col. 3, lines 2-18) The operation of the sensor will now be described. The light produced by the LED 34 is carried to the tip assembly 40 by the source fiber 31. Upon exiting the source fiber, the light emanates into the body 41 in a cone-like shape. Some of the light enters the lens 42 but a portion of the light strikes the spherical annular mirrored surface 49 at the lens end of the body 41. The radius of the mirror 49 is such that the incident light is reflected in a focused fashion onto the tip of the reference fiber 32. The light that enters the lens 42 is collimated or nearly collimated thereby and the collimated light is directed to the diaphragm 44, where it is reflected and subsequently refracted onto the tip of signal fiber 33. Thus the source light is divided, some of the source light never strikes the lens and diaphragm but is simply reflected by mirror 49 into the reference fiber 32, and some of the source light reaching the diaphragm is reflected into the signal fiber 33, the amount depending on the curvature of the diaphragm 44. It can readily be seen that the amount of light reflected to and carried by the reference fiber 32 depends on the intensity of source 34. Therefore, the amount of light reflected from mirror 49 and into the reference fiber is a function of bending of the fiber. (col. 3, lines 23-53)

Thus, *Aagard* merely discloses three fibers 31, 32 and 33. Nothing in *Aagard* shows, teaches or suggests a single optical fiber which is provided with both a measuring signal and a partially reflected measuring signal as claimed in claims 1 and 10. However, *Aagard* teaches away from the claimed invention since fiber 31 carries light to the sensor tip while optical fibers 32 and 33 detect reflected light and light from mirror 49.

Additionally, *Aagard* merely discloses a reference sensor detector 36 and a signal sensor detector 37. However, as claimed in claims 1 and 10, a (single) detector detects both the measuring signal and the partially reflected measuring signal. However, *Aagard* teaches away from the claimed invention since separate sensors 36 and 37 are used to detect a reference signal and a sensor signal.

Since nothing in *Aagard* shows, teaches or suggests a) a single optical fiber passing both a measuring signal and a partially reflected measuring signal and b) a (single) detector detecting the intensity of both the partially reflected signal and the measuring signal as claimed in claims 1 and 10, applicants respectfully request the Examiner withdraws the rejection to claims 1 and 10 under 35 U.S.C. §102(b).

Claims 2 and 3 were rejected under 35 U.S.C. §103 as being unpatentable over *Aagard* in view of *Slemon et al* (U.S. Patent No. 5,051,578). In addition, claims 4-7 and 11-13 were rejected under 35 U.S.C. §103 as being unpatentable over *Aagard*.

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, applicants respectfully request the Examiner withdraws the rejection to the claims and allows the claims to issue.

As discussed above, since nothing in *Aagard* shows, teaches or suggests the primary features as claimed in claims 1 and 10, applicants respectfully submit that claims 2-7 and 11-13 would not have been obvious within the meaning of 35 U.S.C. §103 over *Aagard* alone or taken in combination with *Slemon et al* at least for the reasons as set forth above. Therefore, applicants respectfully request the Examiner withdraws the rejection to claims 2-7 and 11-13 under 35 U.S.C. §103.

The prior art of record, which is not relied upon, is acknowledged. The references taken singularly or in combination do not anticipate or make obvious the claimed invention.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

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